



# CHEMISTRY NMDCAT

(UNIT-3)

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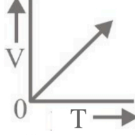
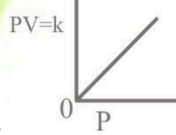
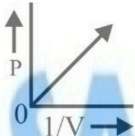
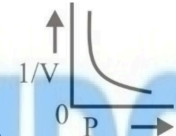
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## TOPICS

### ✓ GASES

- Q.1** R.J Clausius deduced an equation for the pressure of an ideal gas from the postulates of kinetic theory. This equation is called kinetic equation, the correct mathematical form of it is
- a.  $PV = \frac{1}{2} mNc^2$                       b.  $PV = \frac{1}{3} mNc^2$
- c.  $PV = nRT$                               d.  $PV = \frac{1}{3} Nc^2$
- Q.2** The motion imparted to the gaseous molecules due to their motion in all possible directions is known as
- a. Rotational motion                      b. Vibrational motion
- c. Translational motion                      d. Linear motion
- Q.3** Which of the following is equal to  $-12^\circ\text{C}$  temperature
- a. 285 K                                      b.  $-261$  K
- c.  $-12$  K                                      d. 261 K
- Q.4** If  $50\text{cm}^3$  of a gas in a syringe at  $15^\circ\text{C}$  is heated to  $50^\circ\text{C}$  and the piston of syringe is allowed to move outwards against constant atmospheric pressure, the new volume of the hot gas will be \_\_\_\_\_
- a.  $50\text{cm}^3$                                       b.  $44\text{cm}^3$
- c.  $40\text{cm}^3$                                       d.  $56\text{cm}^3$
- Q.5** Select the correct formula for determination of molecular mass from ideal equation (W and m are used for mass of gas)
- a.  $M = \frac{MPW}{RT}$                                       b.  $M = \frac{WRT}{PV}$
- c.  $M = \frac{MRT}{PV}$                                       d. Both "b" and "c"
- Q.6** Which of the following is correct numerical value of general gas constant "R" at S.T.P
- a.  $0.0821\text{dm}^3\text{atm mole}^{-1}\text{K}^{-1}$                       b.  $8.314\text{dm}^3\text{atm mole}^{-1}\text{K}^{-1}$
- c.  $0.0821\text{Jmole}^{-1}\text{K}^{-1}$                                       d.  $62.4\text{ cal mole}^{-1}\text{K}^{-1}$
- Q.7** At high temperature the kinetic energy of the gaseous molecules is very high. As a result the attractive forces between them are
- a. Stronger                                      b. Weaker
- c. Negligible                                      d. Prominent
- Q.8** At  $17^\circ\text{C}$ , a sample of  $\text{H}_2$  gas occupies  $125\text{cm}^3$ . What would be the volume at  $307^\circ\text{C}$  by keeping pressure constant
- a.  $125\text{cm}^3$                                       b.  $250\text{cm}^3$
- c.  $415\text{cm}^3$                                       d.  $350\text{cm}^3$
- Q.9** According to quantitative definition of Charles's law, at constant pressure, the volume of given mass of a gas increases or decreases by \_\_\_\_\_ of its original volume at  $0^\circ\text{C}$  by  $1^\circ\text{C}$  rise or fall of temperature, respectively
- a. 273    b. 1
- c.  $\frac{1}{100}$     d.  $\frac{1}{273}$



- Q.10** The hypothetical temperature at which the given volume of a gas reduces to zero is called \_\_\_\_\_
- Critical temperature
  - Absolute zero
  - Upper consolute temperature
  - Transition temperature
- Q.11** Volume of a gas at STP is  $10 \text{ dm}^3$ , at what temperature its volume will become  $30 \text{ dm}^3$ , keeping pressure constant
- $3^\circ\text{C}$
  - $819^\circ\text{C}$
  - $3\text{K}$
  - $819\text{K}$
- Q.12** If pressure and absolute temperature of the gas is doubled what happens to volume of the gas
- Increases two times
  - Reduces one by four times
  - Increases four times
  - Remain unchanged
- Q.13** Which of the following gas has lowest density at same temperature and pressure?
- $\text{CH}_4$
  - $\text{CO}_2$
  - $\text{N}_2$
  - $\text{CO}$
- Q.14** A gas is considered as an ideal if
- $b = 1, a = 1$
  - $a = 0, b$  is maximum
  - $a = 1, b$  is maximum
  - $a = 0, b = 0$
- Q.15**  $\text{K.E} \propto \text{Temperature}$ , with proportionality constant
- $\frac{2R}{N_A}$
  - $\frac{3R}{N_A}$
  - $\frac{2R}{3N_A}$
  - $\frac{3R}{2N_A}$
- Q.16** The postulate of KMT of gases that needs to be corrected at low temperature
- No force of attraction among gas molecules
  - Gravity has no effect on the motion of gas molecules
  - Volume of gas molecules is negligible as compared to the total volume of the gas
  - All of these
- Q.17** Which graph represents Charles's law
- 
  - 
  - 
  - 
- Q.18** Under constant pressure when the temperature of fixed mass of gas is increased three times then its volume becomes
- $3V$
  - $V/3$
  - $6V$
  - $V/6$
- Q.19** A real gas behaves ideally at
- High pressure, low temperature
  - Low pressure, high temperature
  - High pressure, high temperature
  - Low pressure, low temperature
- Q.20** Which one has more mass at STP
- $1 \text{ dm}^3$  of  $\text{O}_2$
  - $1 \text{ dm}^3$  of He
  - $1 \text{ dm}^3$  CO
  - $1 \text{ dm}^3$   $\text{CH}_4$
- Q.21** At constant temperature volume of the given mass of a gas is directly proportional to the inverse of pressure exerted on it, is called
- General gas law
  - Charles's law
  - Boyle's law
  - Avogadro's law
- Q.22** Density of an ideal gas is inversely related to
- Temperature
  - Molecular mass
  - Pressure
  - General gas constant

a.  $8\text{dm}^3$

c.  $6\text{dm}^3$ 

b.  $4\text{dm}^3$

d.  $2\text{dm}^3$

a. He

c.  $\text{H}_2$ 

b.  $\text{Cl}_2$

d.  $\text{CO}_2$

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- Q.25** Which of the following statement is applicable for both ideal and real gases molecules?
- Have no force of attraction
  - Collisions between the molecules is elastic
  - The actual volume of gas is negligible as compared to the volume of gas
  - Molecules are in random motion
- Q.26** Density of gas will increase with
- Rise in temperature
  - Rise in volume
  - Increase in pressure
  - Decrease in pressure
- Q.27** For a given mass with initial volume 'V', if pressure is reduced to one half and absolute temperature is increased two times. The volume will become
- $2V^2$
  - $\frac{V}{4}$
  - $4V$
  - $6V$
- Q.28** Zero absolute is the temperature where
- Electronic motion is cased
  - Translational motion is cased
  - Nuclear spin is ceased
  - Molecular motion is ceased
- Q.29** The average kinetic energy of gas molecules varies directly as
- Pressure of gas
  - Absolute temperature of gas
  - Density of gas
  - Volume gas
- Q.30** The ratio between increase in volume with rise of temperature as suggested by Charles's law:

Options	V	T(°C)
a.	273	1
b.	1	1
c.	1/273	1
d.	546	1

- Q.31** The Van der Waal's equation i.e;  $\left(P + \frac{n^2a}{V^2}\right)(V - nb) = nRT$  is used for
- Real gases
  - Ideal gases
  - Non-ideal gases
  - Both "A" and "B"
- Q.32** 760torr is equal to \_\_\_\_\_
- 760 pascal
  - 101325pascal
  - 1.01325 pascal
  - 101.325 pascal
- Q.33** The number of molecules of 4g H<sub>2</sub> are \_\_\_\_\_ number of molecules of 56g of N<sub>2</sub>
- Equal to
  - Less than
  - Greater than
  - None of these
- Q.34** What volume would one mole of hydrogen occupy at S.T.P.?
- 11.2 dm<sup>3</sup>
  - 22.4dm<sup>3</sup>
  - 33.6 dm<sup>3</sup>
  - 44.8dm<sup>3</sup>
- Q.35** According to kinetic molecular theory K.E of molecules increase when they
- Are mixed with other molecular at low temperature
  - Are frozen into solid
  - Are condensed into solid
  - Are melted from solid to liquid state
- Q.36** The particles of a gas can be described as
- Only moving outwards in direction
  - Vibrating about defined position
  - Rising upwards
  - Moving randomly in all directions
- Q.37** Gases are considered to be composed of minute discrete particles called
- Atoms
  - Molecules
  - Ions
  - Elements
- Q.38** Which of the following types of motions are present in triatomic molecule
- Translational
  - Rotational
  - Vibrational
  - All of these





- Q.39** Which of the following temperature may be called as coldest temperature  
a.  $0^{\circ}\text{C}$  b.  $-273.16^{\circ}\text{F}$   
c.  $-273.16\text{K}$  d.  $-459^{\circ}\text{F}$
- Q.40** According to kinetic molecular theory, average speed of gas molecules and molecular mass of gas have \_\_\_\_\_ relationship  
a.  $V \propto \sqrt{\frac{1}{M}}$  b.  $V \propto \sqrt{M}$   
c.  $V \propto M$  d.  $V \propto \frac{1}{M}$
- Q.41** The molecules of which gas has highest average kinetic energy at  $25^{\circ}\text{C}$   
a.  $\text{CO}_2$  b.  $\text{O}_2$   
c.  $\text{CH}_4$  d. All have same
- Q.42** Volume of given mass of gas at  $0^{\circ}\text{C}$  is  $273\text{dm}^3$ , volume of same gas at  $10^{\circ}\text{C}$  at constant pressure will be  
a.  $273\left[1 + \frac{10}{273}\right]\text{dm}^3$  b.  $\left[273 + \frac{283}{273}\right]\text{dm}^3$   
c.  $273\left[1 - \frac{10}{273}\right]\text{dm}^3$  d.  $\left[273 + \frac{10}{273}\right]\text{dm}^3$
- Q.43**  $\text{CO}_2$  will show more non-ideal behaviour at  
a.  $17^{\circ}\text{C}$  b.  $0^{\circ}\text{C}$   
c.  $100^{\circ}\text{C}$  d.  $273^{\circ}\text{C}$
- Q.44** Density of gas is maximum at  
a. STP b.  $5\text{ atm} / -273^{\circ}\text{C}$   
c.  $1\text{ atm} / 273\text{ K}$  d.  $0^{\circ}\text{C} / 5\text{ atm}$
- Q.45** Equal mole of different gases at STP have different  
a. Volume b. Number of molecules  
c. Masses d. All of these
- Q.46** A gas will be more ideal at  
a. S.T.P b.  $100^{\circ}\text{C} / 5\text{ atm}$   
c.  $273^{\circ}\text{C} / 1\text{ atm}$  d.  $-273^{\circ}\text{C} / 5\text{ atm}$
- Q.47** The term 'b' cannot be named as  
a. Effective volume b. Excluded volume  
c. Actual volume d. Both 'a' and 'b'
- Q.48** Critical temperature of  $\text{O}_2$ ,  $\text{N}_2$ ,  $\text{H}_2$  and  $\text{CO}_2$  are  $-118.8^{\circ}\text{C}$ ,  $-147.1^{\circ}\text{C}$ ,  $-239.9^{\circ}\text{C}$  and  $31.1^{\circ}\text{C}$  respectively. Which gas among following is most ideal  
a.  $\text{H}_2$  b.  $\text{O}_2$   
c.  $\text{CO}_2$  d.  $\text{N}_2$
- Q.49** At a given temperature and pressure,  $14\text{g}$  nitrogen will have same volume as  $14\text{g}$  of  
a. Oxygen b. Carbon dioxide  
c. Carbon monoxide d. Neon
- Q.50** The molar volume of  $\text{N}_2$  is maximum at  
a.  $273\text{ K}$  and  $2\text{ atm}$  b.  $273^{\circ}\text{C}$  and  $1\text{ atm}$   
c.  $0^{\circ}\text{C}$  and  $2\text{ atm}$  d. STP



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